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09/703,075	10/31/2000	Jose J. Garcia-Luna-Aceves	NC30315	1257

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EXAMINER
PHILPOTT, JUSTIN M

ART UNIT	PAPER NUMBER
2665	14

DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/703,075	GARCIA-LUNA-ACEVES ET AL.	
	Examiner	Art Unit	
	Justin M Philpott	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *16 January 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *11* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed January 16, 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because a date of publication is not provided for references 45, 49, 52 or 54 (see 37 CFR 1.98(b)(5)). The information disclosure has been placed in the application file, but these four references have not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.

Response to Amendment

2. In the Amendment filed January 16, 2003, Applicant has amended claims 1-22 to include further limitations and to correct minor informalities, and has added new claim 23. Accordingly, the previous rejections of claims 4, 7-9, 11, 15, 18 and 20-22 under 35 U.S.C. 112, second paragraph have been overcome in view of the Amendment. Also, claims 4, 7-9, 12, and 21 are no longer objected to in view of the Amendment. Applicant has also amended the specification and has included a proposed set of drawing corrections to correct minor informalities. Accordingly, the specification is no longer objected to and the proposed drawing corrections are approved.

Response to Arguments

3. Applicant's arguments with respect to claims 1-22, and in particular claim 1, have been considered but are moot in view of the new ground(s) of rejection. Particularly, Applicant argues that Meier `436 fails to teach the new limitation to the amended claim 1. That is, Applicant argues Meier `436 fails to teach: "the schedule includes information on when and in what order the transmissions may occur in the network." The newly cited reference in the following Action, however, clearly teaches this new limitation to the amended claim 1 along with motivation for applying this new limitation to the system of Meier `436. Furthermore, with respect to claim 18, Applicant requests evidence be provided indicating that it is known in the art to utilize routers as communicating entities in an RF data communications network, and accordingly such evidence is provided in the following Action.

Claim Objections

4. Claim 1 is objected to because of the following informalities:

Particularly, the amended claim 1 recites, "exchanging scheduling information between the plurality of collocated nodes over the first interface" (lines 7-8) and "exchanging scheduling information associated with transmissions between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the second interface" (lines 9-11). According to the above language it appears the scheduling information is unique for each of the above steps. However, the claim further recites, "determining, based at least in part on the scheduling information, a schedule..." (lines 12-16) and it is unclear to which of the previous two

scheduling information this recitation refers. Applicant is respectfully requested to insert "the" or "said" between "exchanging" and "scheduling" at line 9 (i.e., the second recitation of "scheduling information"), if appropriate, to provide antecedent basis for the reference to scheduling information at line 12 (i.e., a non-specific third recitation of "scheduling information"). Claim 1 as originally filed includes the term "said" at line 9, however, this term has been removed in the amended claim 1, rendering the amended claim 1 unclear.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1, 2, 6-13, 17 and 23 are rejected under 35 U.S.C. ~~102~~ 103(a) (b) as being unpatentable over U.S. Patent No. 5,394,436 to Meier et al. (hereinafter referred to as Meier '436) in view of U.S. Patent No. 5,682,382 to Shepard.

Regarding claims 1, 12 and 23, Meier '436 teaches an RF communications system comprising a plurality of non-collocated nodes (see FIG. 1, bridges 40 and 50), each capable of receiving and transmitting transmissions on a first interface (RF links 106 and 114), and a plurality of collocated nodes (bridges 24 and 42), each capable of communicating between one another over a second interface (data communication link 16). Furthermore, each of the plurality of collocated nodes is capable of receiving and transmitting transmissions to and from the

plurality of non-collocated nodes on the first interface (via RF links 104 and 110). Collocated nodes exchange scheduling information with one another over the second interface, wherein the scheduling information is associated with transmissions between the plurality of collocated nodes and each of the non-collocated nodes on the first interface. The scheduling information determines a schedule (spanning tree, see col. 3, lines 49-55) for the plurality of collocated nodes for transmission between the plurality of collocated nodes and each of the plurality of non-collocated nodes on the first interface. However, Meier '436 does not specifically disclose the schedule information (spanning tree) includes information on when and in what order the transmissions may occur in the network.

Shepard, like Meier '436, teaches a method involving packet radio network communications systems. Shepard, however, further teaches decentralized channel management for providing collision-free packet transfer. Shepard discloses that it is known in the art of packet radio network communications systems that such systems are prone to interference and often require retransmissions due to overlapping transmit and receive windows and thus, waste power for completing such retransmissions (e.g., see col. 1, line 15 – col. 2, line 18). To solve this problem, Shepard introduces a method of decentralized channel management for providing collision-free packet transfer wherein the nodes (stations) exchange scheduling information (schedules) which includes information on when and in what order the transmissions may occur in the network (e.g., see col. 9, line 58 – col. 10, line 4 regarding scheduling a time for transmission with respect to transmit and receive windows). By exchanging scheduling information which includes information on when and in what order the transmissions may occur in the network, Shepard provides collision-free packet transfer wherein interference of

neighboring stations is avoided and accordingly energy typically used for retransmissions is conserved. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to include the scheduling information of Shepard with that of Meier `436 in order to provide a packet radio network communications network having collision-free packet transfer wherein interference of neighboring stations is avoided and accordingly energy typically used for retransmissions is conserved.

Regarding claims 2 and 13, Meier `436 teaches a preferred embodiment wherein collocated nodes exchange scheduling information (HELLO packet) over the first interface during a time frame (col. 20, lines 7-8). Furthermore, it is inherent in the invention of Meier `436 for data to be sent by the non-collocated nodes over the second interface during the same time as the scheduling information is sent over the first interface.

Regarding claim 6, Meier `436 teaches sending a schedule packet (which is part of the information comprised within HELLO packet, see col. 12, line 61 to col. 13, line 27) from a first at least one of a plurality of collocated nodes (bridges) to a second at least one collocated node of the plurality of collocated nodes over a first interface (RF links) as well as sending, in response to receiving the schedule packet, an acknowledgement packet (ATTACH.request, see col. 4, lines 29-31) from the second to the first collocated node(s).

Regarding claim 7, Meier `436 teaches the further steps of: setting a sequence number (count of nodes or number of hops, see col. 4, lines 9-19) to the value of the sequence number of the schedule packet (part of HELLO packet) received; sending a hello packet (part of HELLO packet) which identifies the sending collocated node(s) (address of the sender, see col. 4, line 9) and a sequence number (count of nodes or hops, see col. 4, line 11) of a last sent schedule packet

from the first collocated node(s); determining if the sequence number of the last sent schedule packet is less than the sequence number of a last received schedule packet and in response to a positive determination; and transmitting a hello response to the previous sending collocated node(s) which includes the sequence number for the last received schedule packet. This last step of determining and transmitting is taught by Meier '436 in col. 4, lines 54-61 in combination with col. 4, lines 27-39, wherein a block 215 at the receiving node (bridge) determines whether the sequence number (count of nodes or hops, e.g. distance to the root node) provided by the received schedule packet (HELLO packet) is less than the sequence number (e.g. distance to the root node) provided by the previous schedule packet (HELLO packet). If positive determination is made, a hello response (ATACH.request) is transmitted to the previous sending collocated node(s). Thus, the receiving collocated node(s) maintains position according to the smallest sequence number, i.e., maintains attachment to the spanning tree at the node that is logically closest to the root node (col. 4, lines 59-61).

Regarding claim 8, Meier '436 teaches another embodiment similar to that described above, but which further comprises sending a second hello packet (ATTACH.response) from the first collocated node(s) in response to resetting the sequence number (count of nodes or hops) to the larger of the last sent schedule packet (previous count of nodes or hops) or 1 plus the last received schedule packet (current possible count of nodes or hops) which was received in hello response (HELLO). This embodiment is disclosed in col. 5, lines 6-10 in combination with the description above.

Regarding claim 9, the same argument as made for claim 7 applies here, wherein if a negative determination is made from the determining step of claim 7, the receiving collocated

node(s) still maintain position according to the smallest sequence number, i.e., maintains attachment to the spanning tree at the node that is logically closest to the root node (col. 4, lines 59-61).

Regarding claims 10, 11 and 17, teaches a first interface comprising a wired link (hard-wired communication link, see col. 3, lines 12-13) and a second interface comprising a wireless link (RF links, see col. 3, line 15). Regarding claim 11, Meier `436 discloses RF transmission but does not disclose the use of orthogonal channels for improved RF transmission, however, such an application is commonly known in the art for improved RF transmission and thus is not novel.

7. Claims 3-5, 14-16, 21 and 22 are rejected under 103(a) as being unpatentable over Meier `436 in view of Shepard, further in view of U.S. Patent No. 6,363,062 to Aaronson et al.

Regarding claims 3-4, 14-15 and 21-22, Meier `436 in view of Shepard teaches a system comprising hard-wired and wireless communications between nodes having data and control information. Meier `436, however, does not specifically teach having a first and second time frame for particular transmissions nor does Meier `436 specifically teach exchanging second control information over the second interface.

Aaronson teaches a communications protocol for wireless communications whereby time is broken up into frames, further divided into slots (col. 4, lines 22-44). A control channel, comprising slots used for control information, as well as a data channel, comprising the remaining slots, are provided within each frame. Thus, Aaronson teaches improved means of wireless communications having a first and second time frame in the form of a control channel

and a data channel, or control and data portions. Aaronson, however, does not teach hard-wired communications with a first set of control information through a first interface such as in Meier `436. On the other hand, Aaronson teaches wireless communications such as those found in the second interface (RF links) of Meier `436 whereby both control information and data are transmitted.

The teachings of Meier `436 in view of Shepard would clearly benefit from implementing the communications protocol of Aaronson. Such a combination would provide more reliable transmission between non-collocated and collocated nodes whereby both control information and data could be transmitted between nodes. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to use the communications protocol of Aaronson with the system of Meier `436 in view of Shepard.

Regarding claims 5 and 16, as already described, Meier `436 teaches a system comprising collocated and non-collocated nodes with first and second interfaces whereby scheduling information is exchanged. A schedule packet (HELLO packet) is sent from one or more collocated node(s) to each other collocated node which includes: an indication of all known nodes (combination of the spanning tree and the detached-node list, col. 13, line 20-22), including those within a 2-hop neighborhood of each previous node, and incoming and outgoing collision-free links of the node(s) that are already scheduled (spanning tree). Meier `436 also includes nodes constantly listening while not in active scheduled links (col. 7, lines 35-39). Meier `436, however, does not specifically include time slots and data channels in which new links can be reserved and on which nodes will be listening.

Aaronson teaches time slots and data channels (col. 4, lines 22-62) in which new links can be reserved (lines 34-36) and on which nodes will be listening (to requests and grants on control channel, col. 4, lines 51-55). Applying the scheduling method of Aaronson to the system of Meier `436 would provide an improved means for scheduling within a hard-wired and wireless communications network. Thus, at the time of the invention, it would have been obvious to one of ordinary skill in the art to implement the scheduling method of Aaronson with the system of Meier`436 in view of Shepard.

8. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier `436 in view of Shepard, further in view of U.S. Patent No. 5,673,031 to Meier (hereinafter referred to as Meier `031).

Regarding claims 18-20, Meier `436 teaches an apparatus as described above regarding claim 1, but does not specify using routers. However, Meier `436 *does* disclose using RF networks and bridges as communicating entities in an RF data communications network (e.g., see col. 2, lines 22-34).

Meier `031 teaches a further advancement for a packet radio network communications system such as the system taught by Meier `436. Meier `031 teaches a redundant RF network having a roaming terminal communication protocol to provide communications to remote terminals at greater distances without increasing base station range which would increase power consumption and increase collisions (e.g., see col. 2, lines 16-23 and col. 3, lines 1-29). Meier `031 further teaches advantageously implementing routers as communication nodes (e.g., see col. 30, line 54 – col. 32, line 23) to provide guaranteed coverage for fringe areas without adding

additional wiring and to provide continuing coverage when a wired base fails. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement routers as taught by Meier '031 for the communicating entities in the RF communications network of Meier '436 in order to provide communications to remote terminals at greater distances without increasing base station range and in turn without increasing power consumption or collisions, and wherein guaranteed coverage for fringe areas is provided without adding additional wiring and furthermore wherein continuing coverage is provided when a wired base fails.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott

March 27, 2003

HUY D. VU
SUPERVISORY PATENT EXAMINER
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